

10 / SCANNING¹

Scanners are one of the most useful devices you will come across working in 2D. They are often used to create digital copies of printed images, but can also be used to create art (we'll explore this in a different section). In this section we will discuss some of the basic considerations for scanning including resolution, file size, and tips for getting usable results. We will also complete a simple exercise showing you how to scan using Photoshop.

RESPECT COPYRIGHT

Before we begin think back to the section which discussed copyright issues. Scanning is so common now that it is easy to forget that just because you can scan an image does not give you the rights to use that image. Asking permission to reuse works can often lead into interesting connections with other artists!

SCANNERS

All flatbed scanners operate in the same manner, an image is placed on the scanner surface (bed), light is shined on the object on the bed and the reflected light falls on an image sensor that scans along the bed of the image much like a digital camera, except that the scanner is photographing a line across the bed corresponding to one pixel and then moving down a tiny amount and repeating the process.

You end up with a digital image file that resembles the object placed on the scanner's bed. There are two types of scans: reflective and transmissive.

REFLECTIVE SCANS

These scans bounce light off an image (like a photocopier) to create a digital file from objects like photographs or paper.

TRANSMISSIVE SCANS

These scans pass light through transparent objects like a photo negative or transparency to create a digital image.

Some scanners, like those you find in Studio Foundation, are able to scan both reflective and transmissive originals.

TRUE RESOLUTION

The optical resolution of a scanner refers to how much detail (information) the scanner can capture. The optical resolution is expressed by 2 numbers, such as 600 x 1200. The actual resolution of the image is the first number.

- The 1st number is the number of pixels per inch captured horizontally.
- The second number refers to the number of times the scanner head moves along the vertical direction.

¹ Based, in part, on Digital Foundations, Chapter 07

ENHANCED RESOLUTION

Some scanners use software to make a higher resolution file than they can scan optically. For best results only use the optical resolution, never the enhanced.



Example of Moiré Pattern in image of Bricks²

MOIRÉ PATTERN

A kind of optical interference caused when you scan images that have some kind of regular pattern and results in an interference pattern when scanned.

INTERFERENCE

Just like the human eye a scanner is subject to optical illusions. One example of which is a Moiré pattern pictured above. This is why we always check our final scan before removing the original from the scanner so you can catch and correct problems like this.

FIXING MOIRE

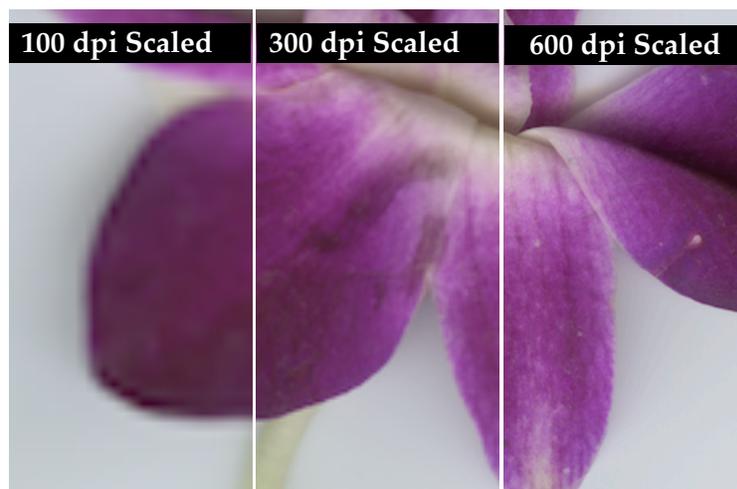
Simply increasing your resolution will often correct this issue. This effect can also happen with digital

cameras (e.g. when photographing a computer screen close up) so check your photos as well.

SCALING

Scaling an image up using an editing program like Photoshop will result in a loss of detail. The best way to scale (resize) an image without losing quality is to select the desired size (or larger) when scanning.

Let's say you have a 5"x5" photograph which you would like to print a 10"x10" copy of at 300 dpi. You can either adjust your scanner to scale the image up in size and scan at 300 dpi or you can scan at the original size but at 600 dpi. The end results would be identical. The image below illustrates the relationship between detail, resolution and scaling an image. For best results, if you want smooth, natural images, scan using the highest native (not enhanced) resolution available on the scanner you are using.



29 SOURCE | http://commons.wikimedia.org/wiki/File:Moire_pattern_of_bricks_small.jpg

SCANNING

Let's scan, it's time to bring some print materials into the digital domain.

YOU WILL NEED:

- Epson Scan Utility
- Epson scanner (available in the SF Cage and Visual Language Labs)
- A Mac running OS X 7 or later.

STEPS:

1. Select an image to scan.
2. Place the original image on the scanner bed (make sure the scanner is turned on and connected to the Mac)
3. Open Epson Scan Utility
4. Choose File > Import > name of scanner
5. Choose preview.
6. Set Bit Depth and Resolution. Remember to determine this based on the final output.
7. Set Color mode (such as grayscale or RGB).
8. Set scaling if you need the image to be larger than the original.
9. UNCHECK Sharpening.
10. Drag a marquee around the area to be scanned

OPT + DEL WILL CLEAR MARQUEE

11. Select Final (the scanner will scan the image and open it in Photoshop)
12. Choose File > Save as, give your file an obvious name.

13. Choose Format TIFF

SCANNING TRIGGERS

Here is a short list of things to consider while scanning:

- Do | Make sure the scan bed is clean.
- Do | Use best original possible to scan.
- Do | Choose glossy over matte originals when possible.
- Do | Straighten the image on the bed
- Do | Determine the size and resolution of your scan.
- Do | Adjust settings so scan is closest to original
- Do | Examine your file after you scan to make sure the image is usable.
- Do NOT | Move or shake the scanner or it's table
- Do NOT | Use built in filters. Photoshop is more flexibility. flexible how?



*A Photogram: scanning circa 1843.*³

³ Photogram of Algae by Anna Atkins 1843: <http://flickr.com/photos/digitalfoundations/2435115622/>